

Massachusetts Profile of

Boston S&SA

GOVDOC

BRA

4494

BOSTON PUBLIC LIBRARY



ENSE PETIT
PLAC

LIBERTATE
QUIETEM



Boston S M S A

INDEX OF MONOGRAPH

- I. GENERAL INFORMATION
 - A. 1. Metropolitan Area
 - 2. County
 - 3. Location
 - 4. Population
 - 5. Land Area
 - 6. Density
 - 7. Climate
 - 8. Topo. Characteristics
 - 9. U.S.G.S. Topo. Plates
 - 10. Aerial Survey Photos
 - 11. Political Districts
- II. POPULATION - U.S. CENSUS, 1970
 - A. 1. General Description
 - B. 1. Number of People
 - 2. Age Composition
 - 3. Racial Data
 - 4. Education
 - 5. Occupation
 - 6. Politics
 - 7. Income

POPULATION - STATE CENSUS, 1965

 - C. 1. Population Movement
 - 2. Age Composition
- III. HOUSING - U.S. CENSUS, 1970
 - A. 1. General Information
 - B. 1. Type of Structure
 - 2. New Construction
 - 3. Age
 - 4. Density
 - 5. Condition
 - 6. Value
 - 7. Monthly Rents
- IV. ECONOMIC BASE
 - A. 1. Historic Trends
- B. Present Economy
 - 1. General
 - 2. Manufacturing
 - 3. Trade
 - 4. Class of Worker
- V. EMPLOYMENT AND PAYROLLS
 - A. All Industries
 - B. Manufacturing
- VI. MUNICIPAL FINANCE
- VII. EDUCATION
- VIII. TRANSPORTATION
 - A. General
 - B. Air
 - C. Bus
 - D. Highway
 - E. Rail
 - F. Trucking
 - G. Water
- IX. ECONOMIC DEVELOPMENT
- X. PLANNING
- XI. UTILITIES
 - A. Electric Service
 - B. Gas Service
 - C. Water Service

MASSACHUSETTS
DEPARTMENT OF COMMERCIAL
AND DEVELOPMENT
100 CAMBRIDGE ST.
BOSTON, MASS. 02207

BOSTON SMSA



MASSACHUSETTS DEPARTMENT OF COMMUNITY AFFAIRS
BUREAU OF REGIONAL PLANNING

10 0 10 20

SCALE IN MILES

5. TOPOGRAPHICAL CHARACTERISTICS

The Boston SMSA fans out from the central city in an irregular semi-circle with an average radius of approximately twenty air-line miles. The general physiographic region of the Commonwealth in which this Area is located is the Seaboard Lowland, characterized by both lower elevation and smoother topography than the Eastern Upland which lies to the west. The SMSA in its westernmost extension reaches the edge of the Upland in Framingham. This general elevation of the Lowland is about four hundred feet above mean sea level in the west and the surface slopes gently downward toward the coast.

Although the region is one of gentle contour, it presents a varied topography. Boston itself is located in a sub-region, the Boston Basin, which, due to the softer underlying rock, is even lower in elevation than the surrounding area, being generally below two hundred feet above mean sea level. To the south of the basin rises The Great Blue Hill-elevation six hundred thirty-five feet. To the north of the basin are the Middlesex Fells, not as high as Blue Hill but presenting a relatively rugged stoney topography, and rising above the basin.

Scattered over the region are groups of tear-drop shaped hills - drumlins - resulting from glacial action. One of the best known of these drumlins is Beacon Hill in Boston. Many other details of the landscape also owe their origin to glacial action. The drainage pattern of the area was deranged by glacial erosion and deposition. The Charles River's meandering course is a fine example of such derangement. The Sudbury, Concord, Ipswich and Neponset Rivers all display wandering courses with considerable development of marsh lands in their systems.

The tidal shoreline of the Boston SMSA reaches around Massachusetts Bay for a distance of four hundred and thirty-five miles. The variety of topography found in the area is reflected in the coast line. In the areas of Beverly, Marblehead and Nahant, for example, are found the "rock bound" shores, while along the Saugus River in Revere are extensive salt marshes. In addition to the natural coast a great many areas of made land exist as the result of filling the natural bays. The land on which the Logan International Airport is located and the "Back Bay" section of Boston are both largely man made. This variety of coastal lands provides scenic recreation areas, sandy beaches for swimming, and level sites beside deep water for industrial and commercial development. In addition this irregular coast line has provided the harbors for the development of great ports and valuable fishing grounds.

9. U.S.G.S. TOPOGRAPHIC PLATES:

The entire SMSA is covered. Maps may be obtained from U.S. Geological Survey, Department of Interior, Washington, 20242, D. C., or local agents.

I. GENERAL INFORMATION

1. STANDARD METROPOLITAN STATISTICAL AREA:

<u>CITIES</u>	<u>TOWNS</u>		
BEVERLY	Arlington	Lincoln	Scituate
BOSTON	Ashland	Lynnfield	Sharon
CAMBRIDGE	Bedford	Manchester	Sherborn
CHELSEA	Belmont	Marblehead	Stoneham
EVERETT	Braintree	Marshfield	Sudbury
LYNN	Brookline	Medfield	Swampscott
MALDEN	Burlington	Middleton	Topsfield
MEDFORD	Canton	Millis	Wakefield
MELROSE	Cohasset	Milton	Walpole
NEWTON	Concord	Nahant	Watertown
PEABODY	Danvers	Natick	Wayland
QUINCY	Dedham	Needham	Wellesley
REVERE	Dover	Norfolk	Wenham
SALEM	Duxbury	North Reading	Weston
SOMERVILLE	Frammingham	Norwell	Westwood
WALTHAM	Hamilton	Norwood	Weymouth
WOBURN	Hanover	Pembroke	Wilmington
	Hingham	Randolph	Winchester
	Holbrook	Reading	Winthrop
	Hull	Rockland	
	Lexington	Saugus	

2. COUNTIES: The Boston SMSA embraces the whole of Suffolk County and parts of Essex County, Middlesex County, Norfolk County and Plymouth County.

3. LOCATION: Eastern Massachusetts, bordered on the east by Massachusetts Bay, on the south by the Brockton SMSA, on the southwest by the Providence-Warwick-Pawtucket SMSA, on the west by the Worcester SMSA and on the north-west by the Lawrence-Haverhill and Lowell SMSA's.

4. POPULATION: 1950: 2,414,368
1955: 2,445,713
1960: 2,595,481
1965: 2,605,452
1970: 2,753,700

5. LAND AREA: 988.29 square miles

6. DENSITY: 1950: 2,443 persons per square mile
1955: 2,485 persons per square mile
1960: 2,626 persons per square mile
1965: 2,636 persons per square mile
1970: 2,786 persons per square mile

7. CLIMATE:	Normal temperature in January (°F):	Boston	Milton	Weston
	Normal temperature in July (°F):	72.9	72.0	72.7
	Normal annual precipitation in inches:	73.7	70.9	73.0
		42.77	47.50	43.02

During the decade 1960 to 1970, the population of the Boston SMSA increased by 211,018, or 7.8%. There was an excess of births over deaths of 244,507. During this same period there was a net out-migration of 33,489.

II POPULATION-U.S. CENSUS - 1970

B-1 NUMBER OF PEOPLE

Year	Number	Ratio to 1930	
		SMSA	STATE
1920	1,914,642	86.3%	90.7%
1930	2,219,629	100.0	100.0
1940	2,264,759	102.0	101.6
1945	2,370,827	106.8	105.7
1950	2,476,191	111.6	110.4
1955	2,531,340	114.0	113.8
1960	2,688,083	121.1	121.2
1965	2,724,374	122.7	124.6
1970	2,899,101	130.6	133.9

B-2 AGE COMPOSITION

Age	Number	% of Total	
		SMSA	STATE
Under 5	234,200	8.1%	8.3%
5 - 14	548,937	18.9	19.3
15 - 19	263,043	9.1	9.0
20 - 64	1,533,447	52.9	52.2
65 - over	319,474	11.0	11.2
Under 18	937,947	32.4	33.0
21 & over	1,801,390	62.1	61.7
Median Age		29.1	29.0

B-3 RACIAL DATA

	Number	Percent of Total	
		SMSA	STATE
White	2,746,585	94.7%	96.3%
Negro	128,158	4.4	3.1
Other	24,358	0.9	0.6
Foreign Stock	976,079	33.7	33.3
Foreign Born	273,103	9.4	8.7

Of the 976,079 persons of foreign stock 22.1% were from Canada, 19.7% Italy, 15.1% Ireland, 7.9% USSR, 7.4% United Kingdom and 3.7% from Poland.

B-4 EDUCATION (Persons 25 yrs old & over)

Median No. of School years completed	Number	% of Total	
		NA	STATE
Completing Less than 5 grades	54,983	3.4%	4.1%
Completing High School	592,303	37.0%	34.9%
Completing College	251,243	15.7%	12.6%

B-5 OCCUPATION

Of the 2,059,588 persons 16 years old and over in the SMSA 1,233,133, or 59.9% were in the civilian labor force. Of these 59.3% were males and 40.7% were females.

B-6 POLITICS, PARTY AFFILIATION, 1972

Total Registered Voters
Registered Democrats
Registered Republican
Unenrolled Voters

Group	No.	% of Total in	
		SMSA	STATE
Prof., Tech. & Kindred	237,669	20.0%	17.4%
Mgrs., Off., & Prop.	108,824	9.1	8.6
Clerical, Etc.	269,592	22.7	19.9
Sales	91,667	7.7	7.0
Craftsmen, Foremen, etc.	139,485	11.7	13.1
Operatives	153,462	12.9	17.6
Pvt. Hahld workers	8,434	0.7	0.7
Service wkrs.	140,744	11.8	11.9
Laborers	39,899	3.4	3.8
Not Reported			

B-7 INCOMES OF FAMILIES & Unrelated Individuals

	Families	SMSA	State
Incomes under \$3,000	41,479	6.0%	6.4%
From \$3,000-\$5,999	73,925	10.6	11.8
From \$6,000-\$9,999	161,521	23.2	25.7
\$10,000-\$14,999	209,253	30.1	30.9
\$15,000 & over	209,300	30.1	25.2
Median Income		\$8,742	\$8,607
Per Capita Income		\$3,713	\$3,425

10. AERIAL SURVEY PHOTOS:

Photos of the municipalities in this Area may be viewed at the Bureau of Regional Planning, Massachusetts Department of Community Affairs, 141 Milk Street, Boston, Massachusetts 02109 where information copies may also be obtained.

11. POLITICAL DISTRICTS:

3rd through 12th Massachusetts Congressional Districts; 1st through 6th Councillor Districts; Bristol, Norfolk and Plymouth; Cape, Plymouth and Islands; 1st, 2nd and 3rd Essex; 2nd through 8th Middlesex; Middlesex and Norfolk; Middlesex and Worcester; Norfolk; Norfolk and Plymouth; Norfolk and Suffolk; Plymouth; and 1st through 6th Suffolk State Senatorial Districts.

2nd through 12th Essex; 1st through 26th, 33rd and 38th through 41st Middlesex; 1st through 14th Norfolk; 1st through 4th and 9th Plymouth and 1st through 18th Suffolk State Representative Districts.

Metropolitan District Commission - In the latter part of the 1800's it became apparent that the closely integrated and densely populated area formed by Boston and the surrounding communities would be in desperate need of integrated public roads, water and sewage services. In 1889 the first of 3 districts or systems was formed by the State which today provides sewage facilities through a northern and southern system to 43 municipalities. In 1893 a parks district was formed supplying a service of maintenance and construction of parks, beaches and boulevards with police protection to 37 municipalities. The water district established in 1895, supplies water to 33 municipalities from 3 large reservoirs holding a total of 487 billion gallons of water, located in central Massachusetts. The water is very soft which makes it very desirable for home and industrial use, and is so pure that only .15 parts per million of residual chlorine gas is found in the mains, and this is almost completely dissipated on reaching the customer. An aggregate of 54 municipalities with a 1970 population of 2,385,607 use one or more of these systems provided by the State through the Metropolitan District Commission. Each community is assessed yearly for the amount of service received.

Massachusetts Bay Transportation Authority - A state controlled agency, established to provide transportation facilities to Boston and 78 other municipalities.

111 HOUSING - U. S. CENSUS, 1970

A-1 Of the Boston SMSA's 936,088 housing units, 51.5% were owner-occupied, 44.4% tenant-occupied and 2.2% were vacant and available for occupancy.

B-1 TYPE OF STRUCTURE (1)

	Percent of Total		
	Number	Boston SMSA	State
1 Unit	419,884	45.1%	50.4%
2 Units	167,239	18.0	16.9
3 & 4 Units	147,668	15.9	15.2
5 or more Units	193,146	20.8	16.9
Mobile Home or Trailer	2,003	0.2	0.6

B-2 NEW DWELLING UNITS*

Year	Number
1960-1964	71,989
1965-1970	84,107
1971	18,019
1972	16,144

B-3 AGE

Year Built	Units	Percent
1965-March 1970	75,115	8.1%
1960-1964	64,591	6.9
1950-1959	132,191	14.2
1940-1949	74,887	8.1
1939 or earlier	583,156	62.7

B-4 PERSONS PER UNIT

Percent in			
Persons	Unit	SMSA	STATE
1 person	175,014	19.5%	18.8%
2 persons	251,139	28.0	28.3
3 persons	148,540	16.5	16.8
4 persons	132,558	14.8	15.0
5 persons	90,400	10.0	10.1
6 persons	100,325	11.2	11.0
or more			
Median persons per unit		NA	2.7

B-5 VALUE OF ONE-DWELLING-UNIT-STRUCTURE

	Percent of		
	Number	SMSA	STATE
Under \$10,000	10,244	2.8%	5.6%
\$10,000-\$19,900	110,617	29.8	39.9
\$20,000-\$24,000	90,818	24.4	22.1
\$25,000 or more	160,020	43.0	31.4
Median Value		NA	\$20,800

B-6 Gross MONTHLY RENTS PLUS UTIL. & HEAT

	Percent of		
		SMSA	STATE
Under \$60	15,972	4.0%	6.6%
\$60 to \$79	33,161	8.2	12.0
\$80 to \$99	43,567	10.8	16.4
\$100 to \$149	168,632	41.8	39.7
\$150 & over	142,219	35.2	25.3
Median Rent		NA	\$117

* From building permits issued

(1) Data for Boston N.A.

II POPULATION-STATE CENSUS, 1965

C-1 During the decade 1955 to 1965, the population of the Boston SMSA increased by 149,739, or 6.1%. There was an estimated excess of births over deaths of 286,302. During this same period there was an estimated out-migration of 136,563.

C-2 AGE COMPOSITION

Age	Male	Female	Total	Percent of Total
Under 5	125,764	120,543	246,307	9.4
5 - 14	246,110	234,800	480,910	18.5
15 - 19	102,326	98,287	200,613	7.7
20 - 64	661,888	723,496	1,385,384	53.2
65 & over	117,772	174,466	292,238	11.2
Total	1,253,860	1,351,592	2,605,452	100.0

NOTE: State Censuses enumerate only regular residents of Massachusetts i.e. they exclude the military and students having domiciles outside the state.

IV. ECONOMIC BASE (Cont'd)B. PRESENT ECONOMY

B.1. General

The Massachusetts Division of Employment Security reported that in 1974 this SMSA had a total of 53,118 firms with an annual payroll of \$10,201,620,845 and an average employment 1,070,470. Boston, the core city of the Area, accounted for 30.5% of the firms, 38.4% of the annual payroll and 37.2% of the average number of employees reported. On the basis of reported totals for the state as a whole the SMSA had 48.4% of the firms, 58.8% of the annual payroll and 53.3% of the average employment. Of the seven major industrial groups as reported in Section V, wholesale and retail trade was the leading source of employment, with 27.6% of the reported total. Second in importance was service with 27.4% of the average employment. The Port of Boston handled 25,728,945 tons in 1974, of which 8,397,307 were foreign imports consisting mostly of residual fuel oil, sugar, kerosene, salt and limestone. The area is a leading wool market, wholesale trading center for New England and part of Canada, world famous as an educational, medical and electronic research center. The Boston SMSA is the heart of 23 contiguous SMSA's in New England and part of 30 odd contiguous SMSA's extending from the Lawrence-Haverhill SMSA south along the Atlantic Coast to Washington, D.C. The many historical shrines and cultural interests draw many thousands of visitors each year. The "industry without a smokestack" - the convention and tourist industry brought an estimated \$45,000,000 from those hundreds of thousands of individuals who attended some 300 conventions (national, international and regional), trade shows and expositions.

2. Manufacturing

In 1974, 4,506 manufacturing firms reported to the Massachusetts Division of Employment Security. These firms employed an average of 259,065 persons and had an annual payroll of \$2,889,095,138. The 7 largest manufacturing groups in order of importance as employers were: electrical machinery, machinery (except electrical), instruments, printing and publishing, fabricated metals, food and kindred products, and apparel.

3. Trade

In 1974, the Division of Employment Security reported 5,168 wholesale firms with an average of 78,777 employees and an annual payroll of \$936,710,912 and 13,945 retail firms with an average of 216,709 persons employed and an annual payroll of \$1,299,023,829. An ever increasing number of shopping centers are being developed in the SMSA among the largest are: Burlington Mall in Burlington, Chestnut Hill Shopping Center in Brookline, North Shore Shopping Center in Peabody, Shoppers World in Framingham and South Shore Plaza in Braintree.

IV ECONOMIC BASEA. HISTORIC TRENDS

The Boston Standard Metropolitan Statistical Area, as defined by the Bureau of the Budget, Executive Office of the President, was settled in 1622. In that year a group of sixty men under the leadership of Thomas Weston, a prosperous London merchant, landed in Wessagusset to form a plantation. The name of this settlement was changed to 'Weymothe', or Weymouth, 13 years later, and the town has the distinction of being the oldest town in the Boston SMSA, the oldest town in Norfolk County, and is second to Plymouth as the oldest settlement in the Commonwealth. Fishing and farming were the principal occupations of these early settlers. It may be said at this point that the two most vital factors in the swift and successful colonization and industrialization of the Area were an abundance of both water power and marine resources. Travel by land was difficult in those days. The most logical, and safest mode of transportation was by ship, and settlements were quickly made to the north, in Salem, Beverly, Lynn and Boston. Great natural harbors and rivers gave impetus to the rapid rise of one of the Area's earliest and greatest industries - shipbuilding. A sterling example of the progression of this industry from those early years of settlement until now is Quincy's largest industry, the Quincy Yard of General Dynamic's Electric Boat Division, which has become one of the world's outstanding plants, where vessels of almost every conceivable type, from seven-masted schooners to giant warships, have been constructed. Herring and King Cod were in abundance in the offshore waters, to feed the burgeoning communities and provide another great industrial base and item of trade. Saw mills, grist mills and tanneries mushroomed, powered by the waters of inland streams. Difficulties incidental to settlement, in what sometimes proved to be a hostile environment, were soon surmounted, and each town and community, in its own fashion, began to make its contribution to the sum total of the Area's uniqueness. The town of Beverly gave the Area, and the country, its first cotton mill, and the first cotton mill in the world where the whole process of cotton manufacturing, from spinning to weaving, was carried on by power was established in Waltham in 1813. The first dies for coins were made by Joseph Jenks in 1652 in Lynn. Isaac Singer patented and manufactured his first sewing machine in Boston in 1851. The first canal, dug for the specific purpose of creating water power, was completed in Dedham in 1639. Quincy gave our country two great presidents - John Adams and John Quincy Adams, and is the site of the first commercial railroad in the United States. Granite from its quarries has been used in notable structures all over the world. The first wool worsted mill in the country was established in 1695 in Boston.

The interests of education were not forgotten or overlooked during the early days of colonization. Six years after the settlement of Boston, in 1636, twelve ministers and magistrates established a college at 'Newe Towne' - now Cambridge. One half of the property of John Harvard, and his entire library, was bequeathed to the university that now bears his name. Cambridge, and its neighbor across the Charles River, has become in recent years the educational, cultural, medical and research center of the Americas. Space limitations make it impossible to list every individual contribution made by each of the 78 cities and towns that comprise the Area, but they have been the spawning ground for many of the world's greatest industries; printing and publishing, rubber goods and footwear, chemicals, wearing apparel, and paper and allied products - to mention a few. It is an Area clothed with deep historical significance. The first shots for American freedom were fired within its confines, the first blood spilled by a former slave, Crispus Attucks, from British guns.

Its facilities for recreation and cultural activity are many and varied. Many attractions beckon the tourist Yacht racing at Marblehead, Boston's world-renowned symphony orchestra, the Iron Works at Saugus, the Green at Lexington and Concord. The first municipal water supply system in the country was built at Boston in 1652, and here in 1876 Alexander Graham Bell spoke the first word over his newly-invented telephone.

V. EMPLOYMENT AND PAYROLLS as reported to the DIVISION OF EMPLOYMENT SECURITY*

A. ALL INDUSTRY

Industry	No. of Firms	1974	Avg. 1974	Percent
		Annual Payroll	Employees	Distribution by Employees
1. Agriculture & Mining	579	29,318,836	3,708	0.3%
2. Construction	5,390	714,447,495	53,866	5.0
3. Manufacturing	4,506	2,889,095,138	259,065	24.2
4. Trans., Comm., & Utilities	2,167	851,115,437	73,284	6.9
5. Wholesale & Retail Trade	19,113	2,235,734,741	295,486	27.6
6. Finance, Ins. & Real Estate	4,877	948,050,946	92,103	8.6
7. Service Ind.	16,486	2,533,858,252	292,959	27.4
TOTAL:	53,118	10,201,620,845	1,070,470	100.0%

B. MANUFACTURING

S.I.C. Group	No. of Firms	1974	Avg. 1974
		Annual Payroll	Employees
19. Ordnance & Accessories	4	72,352,702	4,595
20. Food & Kindred Prod.	251	184,801,276	17,512
21. Tobacco Mfg.	-	-	-
22. Textile Mill Prod.	79	43,757,622	4,221
23. Apparel & other Fin. Goods	404	96,959,504	13,747
24. Lumber & Wood Prod.	71	12,571,689	1,359
25. Furniture & Fixtures	165	26,584,824	2,765
26. Paper & Allied Prod.	112	108,426,634	10,221
27. Printing, Publ. & Allied	746	239,173,904	21,769
28. Chemicals & Allied	205	102,131,986	8,221
29. Prod. of Petroleum & Coal	19	8,448,014	649
30. Rubber Products	113	99,410,535	10,525
31. Leather & Leather Prod.	191	66,143,227	8,048
32. Stone, Clay & Glass Prod.	130	38,284,391	3,356
33. Primary Metal Industries	92	39,291,089	3,347
34. Fabr. Metal Products	462	234,385,182	20,324
35. Machinery (ex. electrical)	618	424,490,860	35,235
36. Electrical Machinery	386	557,725,278	49,419
37. Transportation Equipment	53	179,289,459	13,282
38. Prof., Scient. & Control. Inst. Photo., & Optical Goods, Watches & Clocks	229	314,067,369	26,006
39. Miscellaneous Mfg. Ind.	176	40,799,593	4,468

* The 1974 figures are based on the revised Standard Industrial Classification Code - 1967.

IV. ECONOMIC BASE (Cont'd.)

3. Trade (Cont'd.)

The 1972 U.S. Census of Business reported the following Retail Trade data based on the 1972 Standard Industrial Classification for Boston SMSA and the State:

SMSA (1)				STATE			
Establishments	23,318			49,864			
Sales	\$7,046,575,000			\$13,298,580,000			
Per Capita Sales (2)	\$2,431			\$2,338			
Paid Employees in workweek including March 12	197,287			367,615			
Classification of Business	Estab.	Sales (Add 000)	% of Total	Estab.	Sales (Add 000)	% of Total	
Building Matl., Hardware, Farm Equipment Dealers	800	\$ 248,948	3.4	1,912	\$ 585,932	4.4	
General Merchandise Group	790	1,026,237	14.6	1,754	1,850,781	13.9	
Food Stores	3,068	1,503,801	21.3	6,202	2,905,219	21.8	
Automotive Dealers	1,020	1,068,561	15.2	2,724	2,112,043	15.9	
Gasoline Service Stations	2,000	378,084	5.4	4,698	794,948	6.0	
Apparel, Accessories Stores	1,841	461,385	6.5	3,528	803,271	6.0	
Furniture, Home Furnishings, Equipment Stores	1,478	391,664	5.6	3,151	685,295	5.2	
Eating & Drinking Places	4,538	672,645	9.5	9,683	1,226,601	9.2	
Drug Stores, Proprietary Stores	945	201,306	2.9	1,814	384,069	2.9	
Misc. Retail Stores	5,171	876,100	12.4	11,183	1,596,229	12.0	
Nonstore Retailers	1,667	217,844	3.1	3,215	354,192	2.7	

(1) 1973 Definition

(2) 1970 Population - 2,899,101

4. Class of Worker

The 1970 U.S. Census of Population, which reported information on the basis of residence rather than place of employment showed that there were 899,010 private wage and salary workers, 177,268 Government workers, 57,642 self-employed and 2,554 unpaid family workers living in the Boston SMSA.

VIII TRANSPORTATIONA. GENERAL

The economic well-being of any densely populated area is largely dependent on its ease of accessibility through an adequate and well-planned arterial system. The Boston SMSA has a well-integrated air, highway and rail transportation system. Ease of access to and from the core city of Boston to its contiguous towns and outlying manufacturing centers is an outstanding characteristic of this highway system.

B. AIR

The center of air activity in the Area is at Boston's Logan International Airport which is built on about 2,000 acres of filled-in land extending into Boston Harbor. Other commercial airports in the Area include: L. G. Hanscom Airport (in Bedford) a joint civil-military operation with runways of 7,000 feet and 5,000 feet, Beverly Municipal Airport with runways of 5,000 feet, 4,637 feet and 3,500 feet, Danvers Airport with a 1,500 foot runway, Norfolk Airport with 2 runways of 2,640 feet and 1,700 feet and Norwood Municipal Airport with 2 runways of 4,000 feet each. The Massachusetts Port Authority operates Hanscom and Logan Airports.

Logan Airport is the closest of any metropolitan airport in the United States to its downtown business district (about 10 minutes travel time) and the 8th busiest airport in the world based on number of passengers with tickets starting or terminating at Boston (no transfers included). Logan is served by 31 scheduled airlines - 20 certificated air carriers and 11 commuter airlines - in addition to numerous non-scheduled operations. This facility has 5 runways of 10,090 feet, 10,002 feet, 7,850 feet, 7,002 feet and 2,468 feet. In addition there is an 1,800 foot STOL (short take-off and landings) runway. This runway is expected to do much to reduce taxed air facilities, because about 36% of Logan's passenger traffic is in the Northeast Air Corridor and most of the passengers are businessmen. In calendar 1972, this facility handled:

	<u>Domestic</u>	<u>International</u>	<u>Total</u>
Flights	224,991	20,477	275,336(1)
Passengers	9,136,346	1,337,566	10,547,984(1)
Mail	72,230,541	2,982,497	75,213,038
Cargo	243,909,978	66,055,394	309,965,372

(1) includes general aviation, military and government

C. BUS

Private carriers are franchised to provide service to the Area. The public carrier serving the Area is described more fully in Section H.

D. HIGHWAY

The network of numbered highways serving the SMSA may best be understood by consulting the map accompanying this monograph. The principal numbered highways serving the Area, except for State Route #128, the circumferential highway around Boston emanate from the Boston Area like the spokes of a wheel: Interstate Routes #90, #93 and #95, State Routes #2, #3, #9, #24, #28 and #138 and U. S. Routes #1, #3 and #20.

The Massachusetts Turnpike (IR #90) stretches from downtown Boston westward, leaving the Commonwealth in West Stockbridge and thence on to its terminus in Seattle, Washington. There are 13 interchanges on the Massachusetts Turnpike within the Area - one each in Framingham and Natick, 2 in Weston, 2 in Newton and 7 in Boston.

VI MUNICIPAL FINANCE

The core city of Boston, with 4.4% of the SMSA's land area, 23.3% of the population, levied 28.9% of the total tax levy and accounted for 30.7% of the total net debt..

VII EDUCATION

The Massachusetts Department of Education reported that in the fall of 1972, the number of school attending children to and including grade 12 in the SMSA was 635,723, of which 603,468 were going to public schools and 32,255 were going to private schools. Comprehensive current operating cost per pupil in net average membership for the 1971-1972 school year ranged from \$835 in Dedham and Winthrop to \$1,545 in Winthrop.

As of September, 1972, teachers' salaries ranged from a low of \$7,150 in Chelsea in the bachelor's degree category to a high of \$15,729 in Cambridge in the master's degree category.

The Area contains 70 higher educational facilities. There are 3 medical schools, 3 dental schools, a college of pharmacy and a college of optometry.

E. RAIL

The area is served by 3 railroads - Boston and Maine, Fore River and Penn Central. Piggy-Back facilities available to serve the various sectors of the SMSA are located in Boston, Cambridge, Manchester, N.H., Providence, R.I. and Worcester.

F. TRUCKING

Several hundred trucking firms provide competitive service to local and long-distant points. There are 2 tandem trailer lots along the Massachusetts Turnpike in the SMSA - one at Interchange #14 in Weston and the other at Interchange #18 in the Beacon Railroad Yards in the Allston sector of Boston.

G. WATER

The area contains 4 harbors capable of handling ocean and coast wise ships at Boston (the principal port), Fore River, Back River and Salem. These 4 harbors are 200 miles nearer Africa and Europe than New York, 1,200 miles nearer Panama and the west coast of South America than San Francisco and nearer Rio de Janeiro and Buenos Aires than any other North Atlantic Port.

After many years of inactivity and doubts as to its future, the Port of Boston, through the efforts of the Massachusetts Port Authority, has capitalized on the container revolution in world shipping to return to prominence as one of the leading deepwater ports.

Boston once again is taking advantage of such natural assets as its location - 200 miles closer to Europe and North Africa than any other major U. S. port - and its fine harbor - all of its major facilities are within $6\frac{1}{2}$ miles or one hour from the open sea. Two major container terminals - Massport's Boston-Mystic Container Terminal and Sealand's Castle Island Terminal - handled approximately 80,000 T.E.U.'s (20-foot equivalents) in 1973.

The Boston-Mystic terminal was completed in 1971 at a cost of \$25 million. It features two large container cranes - the 70-ton Hitachi, the world's largest, and the 45-ton Paceco. Security at the terminal is maintained through a control tower equipped with a communications console and computerized inventory system, a photo-identification system for truck drivers and proper lighting and fencing. There has never been a container stolen from the Port of Boston. The terminal also features a marshalling area for 4,000 containers at a time and a 150,000 square foot stripping and stuffing shed. After less than three years of operation, the terminal is operating at near to capacity and Massport is developing preliminary plans for the possible construction of an additional container facility.

In addition to the Sealand terminal Massport's Castle Island Terminal, with over 100 acres, 370,000 square feet of covered transit space and seven berths, is a major facility handling such cargo as lumber and foreign automobiles.

Massport's Commonwealth Pier, New England's only passenger ship pier, was the arrival and departure point for approximately 40,000 cruise passengers in 1973. This total, along with the number of major cruise ship departures (53) is a record for the Port of Boston, the fifth largest passenger port in the country.

G. WATER (cont'd)

The two-story Commonwealth Pier, with vehicle entrances on both levels, contains a floor area of 600,000 square feet. It offers the following features: indoor parking, improved ground transportation and government processing, and Boston's only dockside freezer, with a volume of one million cubic feet.

Massport also operates East Boston Pier #1, which includes a 195,000 square foot steel transit shed and 20 acres of storage space. Massport has spent over \$750,000 in improvements to this terminal in the past three years.

SHORTEST ROUTES TO IMPORTANT FOREIGN PORTS AND JUNCTION POINTS

	<u>To</u> <u>FASTNET</u> <u>IRELAND</u>	<u>Boston's</u> <u>Advantage</u> <u>(miles)</u>	<u>To</u> <u>BISHOPS ROCK</u> <u>ENGLAND</u>	<u>Boston's</u> <u>Advantage</u> <u>(miles)</u>	<u>To</u> <u>PENTLAND FIRTH</u> <u>SCOTLAND</u>	<u>Boston's</u> <u>Advantage</u> <u>(miles)</u>
Boston	2,669		2,783		2,947	
New York	2,837	168	2,957	174	3,120	173
Philadelphia	2,985	316	3,092	309	3,263	316
Baltimore	3,123	454	3,230	447	3,401	454
Norfolk	3,002	333	3,107	324	3,280	333

	<u>To</u> <u>BORDEAUX</u> <u>FRANCE</u>	<u>Boston's</u> <u>Advantage</u> <u>(miles)</u>	<u>To</u> <u>STRAIGHTS OF</u> <u>GIBRALTER</u>	<u>Boston's</u> <u>Advantage</u> <u>(miles)</u>	<u>To</u> <u>AZORES</u>	<u>Boston's</u> <u>Advantage</u> <u>(miles)</u>
Boston	3,094		3,008		2,086	
New York	3,258	164	3,180	172	2,247	161
Philadelphia	3,406	312	3,320	312	2,392	306
Baltimore	3,544	450	3,466	458	2,409	323
Norfolk	3,423	329	3,335	327	2,401	315

	<u>To</u> <u>CAPETOWN</u> <u>SO. AFRICA</u>	<u>Boston's</u> <u>Advantage</u> <u>(miles)</u>
Boston	6,707	
New York	6,786	79
Philadelphia	6,861	154
Baltimore	6,912	205
Norfolk	6,790	83

(SOURCE: U.S. Navy Hydrographic Office)

H. OTHER

The Massachusetts Bay Transportation Authority has the responsibility of providing adequate transportation facilities to the 78 municipalities of the SMSA and the town of Maynard. To Boston and 13 other municipalities the Authority provides - buses, trolley buses, street cars, some rapid transit trolley lines, and rapid transit trains (elevated and in tunnels). The responsibility of the authority has led to subsidizing bus companies and railroads to provide passenger transportation in the outlying sectors of the Area and one bus company has been bought out right.

IX ECONOMIC DEVELOPMENTA. ORGANIZATIONS

Information concerning available commercial or industrial sites may be obtained from the Economic Development Division, Massachusetts Department of Commerce and Development or the pertinent Chamber of Commerce, Industrial Development Commission or Redevelopment Authority. In the following list municipalities having a Chamber of Commerce are designated by (*), these may be addressed without street and number, those having a Redevelopment Authority are designated by (X), and those having an Industrial Development Commission are designated by (O) - the last two categories should be addressed at the City or Town Hall. Cities are in capital letters:

OX*Arlington	Lincoln	OX REVERE
O Ashland	OX*LYNN	O *Rockland
Bedford	Lynnfield	OX*SALEM
Belmont	X*MALDEN	O Saugus
X*BEVERLY	Manchester	O *Scituate
OX*BOSTON	*Marblehead	O Sharon
O Braintree	O Marshfield	Sherborn
X*Brookline	O Medfield	X*SOMERVILLE
O *Burlington	OX*MEDFORD	O Stoneham
OX*CAMBRIDGE	X*MELROSE	O Sudbury
OX*Canton	O Middleton	Swampscott
OX*CHELSEA	O Millis	Topsfield
Cohasset	Milton	O *Wakefield
X*Concord	Nahant	O *Walpole
O *Danvers	OX Natick	O *WALTHAM
X*Dedham	*Needham	OX Watertown
Dover	X*NEWTON	Wayland
Duxbury	Norfolk	*Wellesley
*EVERETT	O *North Reading	Wenham
OX*Framingham	O Norwell	Weston
Hamilton	O *Norwood	Westwood
O Hanover	OX*PEABODY	OX Weymouth
O Hingham	O Pembroke	OX*Wilmington
O Holbrook	O *QUINCY	Winchester
X Hull	O Randolph	O *Winthrop
*Lexington	O Reading	X*WOBURN

B. LABOR SUPPLY

Current data on labor supply should be requested from the Massachusetts Division of Employment Security, Staniford Street, Boston, 02114.

X PLANNING

All seventy-eight municipalities in the Boston SMSA have established a planning board and adopted zoning regulations. Sub-division control powers are exercised by all but seven municipalities (Arlington, Belmont, Cambridge, Chelsea, Marblehead, Somerville and Watertown). The lack of available land in these municipalities on which to lay out sub-divisions, make a regulation governing unnecessary.

Master plans have been completed in all but four municipalities - Millis (being accomplished), Norwood, Rockland, and Winchester.

The Metropolitan Area Planning Council includes all the municipalities of the SMSA, except Pembroke, which is a member of the Old Colony Planning Council. Both planning agencies have as the primary objectives, the development of a regional plan and the coordination of the myriad planning activities within their respective regions.

XI UTILITIESA. ELECTRIC SERVICE

Electric service is supplied to the 78 cities and towns of the Boston SMSA by 13 municipally operated utilities and 6 privately owned firms. The two firms serving the largest number of municipalities, in whole or in part are the Boston Edison Company serving 33 and the Massachusetts Electric Company serving 20.

B. GAS SERVICE

Gas service is supplied to 77 municipalities by 6 privately owned firms and 1 municipally owned utility. Dover does not have piped gas service. The two firms serving the largest number of municipalities in whole or in part, are the Boston Gas Company serving 47 and the Brockton Taunton Gas Company serving 14.

C. WATER SERVICE

Every municipality in the SMSA except Sherborn, has a public water supply. Of the remaining 77 cities and towns: 32 municipalities depend on surface sources, 27 depend on ground sources and 20 depend on ground and surface sources. The Metropolitan Water District serves 32 municipalities in whole or in part. The following are averages of chemical analyses of samples taken at 4 divergent points in the SMSA in 1972 by the Division of Environmental Health, Massachusetts Department of Public Health:

	<u>Milligrams per Liter</u>			
	<u>Metropolitan Water District</u>		<u>Natick</u>	<u>Woburn</u>
	<u>Tap in</u>	<u>Tap in</u>	<u>Tap in</u>	<u>Gravel-Packed</u>
	<u>Revere</u>	<u>Quincy</u>	<u>Town Hall</u>	<u>Well 13</u>
Turbidity	1	0	0	0
Color	30	19	4	5
pH	6.7	6.4	6.9	6.6
Alkalinity	9	8	51	42
Hardness	17	19	92	83
Sodium	7.0	8.0	31	52
Potassium	0.9	1.0	2.4	3.3
Iron	0.27	0.27	0.01	0.05
Manganese	0.01	0.03	0.01	0.01
Silica	3.6	3.6	14	7.2
Sulfate	7	9	16	22
Chloride	12	13	64	97
Spec. Cond.	74	83	324	423
Ammonia - N	0.02	0.01	0.00	0.00
Nitrate - N	0.3	0.3	0.7	0.6

